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Sound Identification Training: Auditory Armament for the Battlefield

By Dr. Doug Ohlin

Soldiers go to war with the hearing they have—not the hearing we wish they had or even the hearing they had when they came into the Army! Over a typical soldier's career, most hearing loss is incurred in training and to a lesser extent in combat. You don't agree? Think about it. Soldiers train as they fight. Over a military career, how much time is spent in combat firefights as opposed to training in garrison? Still don't agree? Then read no further. You are probably one of those who also believe our soldiers are losing all their hearing from listening to rock and rap music. Cultural biases aside, that's like comparing the lethality of a BB gun to a howitzer. There is no comparison. A soldier can lose more hearing from one unprotected firing exercise than from years of listening to loud music.

Garrison-Based Hearing Conservation Programs

Noise is generally defined as *unwanted* sound. Hearing conservation programs are designed to protect and preserve the ability to hear *wanted* sounds vital to maintaining situational awareness and effective communication. Hearing conservation professionals in garrison (Army post) employ a variety of motivational strategies to elicit command emphasis and program compliance:

- For the benefit of our senior leadership, reduced noise-induced hearing loss has been associated with cost savings/cost avoidance (Ohlin, 1998). Training costs for individuals profiled out of a job specialty and for their replacements can add up quickly, as can hearing loss compensation and disability costs.
- For noise-exposed individuals, a focus on the hearing mechanism itself is sometimes effective and is required by regulation and law (Department of the Army, 1998). The wonders of the ear, its vulnerabilities and the permanency of damage to nerve hair cells in the inner ear are emphasized. Since the layperson's knowledge of the ear usually doesn't extend beyond the eardrum, the hope is that mere mention of permanent nerve damage will have them scrambling for earplugs.
- Medical professionals, notably audiologists, often advocate preservation of good hearing as a quality of life issue, i.e., how hearing is our most precious learning and social sense. However, preservation of an ability to hear grandchildren is usually not on the radar scopes of nineteen-year olds living in the moment. Such considerations are not foremost in anyone's mind bound for combat either.

Hearing Conservation Forward

The importance of an effective garrison-based hearing conservation program may be no less significant than the training conducted there. However, to match the transformation efforts of the Army, the time has come to extend our thinking and our hearing conservation efforts even more forward — forward to the battlefield. Although it may appear contradictory, a focus on the battlefield can provide increased relevance for garrison-based hearing conservation programs.

For years, this author has advocated an association of hearing conservation measures with mission accomplishment. For example, if hearing protection is worn properly, there is less of a tendency to flinch at the impact of small arms being fired and the soldier will shoot more accurately – something members of rifle and pistol teams seem to have always known. Preservation of hearing, though, can be associated with something more important than a high marksmanship score. The ability to make accurate sound identification can

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be a life or death matter during hostile actions. These abilities will also be required to support the latest "actionable intelligence" initiative in the US Army, where every soldier is a sensor (Iwicki, 2004).

In 1952, the Office of Naval Research reported the results of intensive interviews with hundreds of returning front-line soldiers who indicated that in combat, "sound was more important than all other means of equipment identification" (ONR, 1952). Combat-relevant sound sources included aircraft, mortar and artillery rounds, rifle and machine gunfire and various other weapons. "The men regarded the sound of enemy weapons as such an important means of identification that they rarely made use of captured equipment because it resulted in their being fired upon by friendly troops" (ONR, 1952).

The National Ground Intelligence Center (NGIC) has conducted interviews with soldiers returning from Iraq and Afghanistan and has confirmed these earlier findings with the following observations from these soldiers: (Monroe, 2004)

- "Unlike visual information, information carried by sound comes to us from all directions, through darkness and over or through many obstacles to vision."
- "Aggressive action produces sound the enemy cannot hide or camouflage."
- "Sound is often the first source of information a Warfighter has before direct contact with the enemy."

Although some of these observations may be obvious to anyone with a background in acoustics, these soldiers gained such insights first hand through combat experience, not from a book. Knowing these combat-relevant sounds is a vital component to situational awareness that can provide a tactical advantage for accomplishing the mission. Dr. John Monroe of the NGIC further elaborates:

"Accurate reporting of battlefield incidents is important for proper intelligence. This is essential for reducing uncertainty regarding enemy intent, external support, enemy capabilities and weapon lethality. This factor was the catalyst to begin the 'Sound Identification for Warfighters' effort at the NGIC. An intelligence officer requested a product soldiers could use to learn to accurately identify a few sounds [rocket propelled grenades (RPG's), mortars, grenades, improvised explosive devices (IED's)] because some soldiers were misreporting…RPG launches as mortar launches, grenade explosions as IED explosions, etc; and these inaccurate incident reports were adversely affecting the quality of the military intelligence" (Monroe, 2004).

Veterans of conflict value hearing as a 360-degree warning sense, which inherently underscores the problem. These are the survivors who learned through chance encounters the value of their hearing and of combat-relevant sounds. Returning Vietnam veterans reported that bird calls in the lower jungle canopy meant that Viet Cong could be in the area because the birds had come down from the upper canopy to feed on spilled rice (US Army, 1989). After being shot at, they knew the difference between the noise signatures of an AK-47 and an M-16. Good hearing in both ears also facilitated the localization (ability to pinpoint direction) of sniper fire and other relevant sounds.

Data that indicate a correlation between good hearing and mission performance are available, but are limited to missions in tank simulators and the detection of a handful of combat sounds (Garinther and Peters, 1990; Price et al., 1989). Results of these studies have a limited reach and application. Sound identification training, however, significantly extends the auditory advantage to individual soldiers. "Combat-relevant sound identification gives the US soldier the edge in any hostile encounter by capitalizing on the underutilized sound-identification capability of the ear" (Monroe, 2004). The NGIC is providing auditory armor that weighs nothing. The only cost is the marginal investment of time required to be exposed to relevant combat sounds through audio recordings.

From a hearing conservation perspective, we are interested in how well these combat-relevant sounds can be heard with special level-dependent ("nonlinear") hearing protection such as the Combat Arms Earplug. Other types of hearing protectors that are designed to facilitate communication and situational awareness should also be studied.

To no avail, a compelling case was made over 50 years ago to institute sound-recognition training for our troops. Over 20 years ago, there was an attempt to obtain recordings of M-16 and AK-47 noise signatures to demonstrate to soldiers the value of protecting their hearing. Our request was blown off with the bureaucratic response that such things were classified. Thanks to the NGIC's recent efforts, we can finally marry the objective of the Army's Hearing Conservation Program to maintain good hearing with the objective of a training program that focuses on what is relevant to hear.

For further information on Sound Identification Recordings for Warfighters, contact Dr. John N. Monroe, Jr., The National Ground Intelligence Center, 434.980.7420 or **john.monroejr@us.army.mil**

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